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Short run behaviour of long-term interest rates in the euro area 12

A Probit model approach

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Resumo

O objetivo da investigação é avaliar os fatores que afetam o comportamento de curto prazo das taxas de juro de longo prazo na área do euro 12 e aconselhar os respetivos governos sobre o momento de emissão de dívida soberana, evitando a ocorrência de custos desnecessários com o serviço da dívida. Uma abordagem de modelo Probit é usada nesta avaliação. Os resultados mostram que as três variáveis que mais afetam o comportamento de curto prazo das taxas de juros de longo prazo nominais são: as compras do governo, o investimento fixo e a inflação do índice de preços do consumidor (IPC). Os governos da área do euro 12 enfrentam taxas de juro de longo prazo nominais mais baixas quando emitem dívida em períodos de expansão económica. Deste modo, os custos gerais com o serviço da dívida podem ser reduzidos.

Palavras chave: Curto prazo, Taxas de juro de longo prazo, Serviço da dívida soberana, Área do euro 12

Abstract

The research objective is to assess the factors that affect the short run behavior of long-term interest rates in the euro area 12 and advise the respective governments on the timing of issuing sovereign debt, avoiding the occurrence of unnecessary costs with the service of debt. A Probit model approach is used in this assessment. Results show that the three variables that most affect the short run behavior of long-term interest rates are: government purchases, fixed investment, and Consumer Price Index (CPI) inflation. Governments of the euro area 12 face lower nominal long-term interest rates when issuing debt in periods of economic expansion. In this way, the general costs of servicing the debt can be reduced.

Key words: Short run, Long-term interest rates, Sovereign debt service, Euro area 12

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Chapter 1
Introduction

The research objective is to assess the factors that affect the short run behavior of long-term interest rates in the euro area 12 and advise the respective governments on the timing of issuing sovereign debt, avoiding the occurrence of unnecessary costs with the service of debt. The method used is quantitative (econometrics). The short run focus is explained by the acknowledge short-termism behavior of financial markets, and by the need for governments to choose the right time to issue sovereign debt, to reduce the sovereign debt service.

The motivation of the research is the sovereign debt crisis of the euro area in 2010 that followed the Global Financial Crisis (GFC) of 2008. The GFC led the euro area almost to a collapse. The crisis ended with the 2012 "Whatever it takes" statement of Mário Draghi, at the time president of the European Central Bank (ECB). Meanwhile, a few euro area Member States, including Portugal, were under the bailout programmes of the Troika, the decision group formed by the European Commission (EC), the European Central Bank (ECB), and the International Monetary Fund (IMF).

According to Costa, Martins, and Guedes de Oliveira (2016), the Troika bailout programmes presupposed three steps to quick economic recovery: Step 1- The reduction of public deficit through extensive government spending reduction and lowering wages in the public sector; Step 2 – The improvement in external competitiveness and/or of the trade balance, trough lower wages in the private sector encouraged by the lower wages in the public sector; Step 3- Wait for an improvement in human well-being as a result of economic growth. Like in Giavazzi and Pagano (1990), Reinhart and Rogoff (2010), and Alesina and

Ardagna (2010), the Troika belief was that cutting government spending and lowering wages would lead to renewed confidence and a quick economic recovery, stabilizing sovereign debt and long-term interest rates.

The dissertation unfolds as follows. After this introduction, Chapter two yields a literature review that covers the New Neoclassical Synthesis of the business cycle, the HP filter, the variables affecting long-term interest rates in the short run, and the way financial markets expectations affect government debt. Chapter two is followed by Chapter three, with the empirical analysis (data and its treatment, regression model, results, and discussion). Chapter four concludes the dissertation.

Chapter 2
Literature Review

2.1 The New Neoclassical Synthesis of the business cycle

The view of the business cycle adopted in this dissertation is the New Neoclassical Synthesis (NNS, Goodfriend, and King, 1997). The New Neoclassical Synthesis is still the view adopted by the European Institutions, namely the ECB, the EC, and the European Council, the Organization for Economic Cooperation and Development (OECD), the IMF, and other renowned Institutions (Costa *et al.*, 2020). It is the core fundament for central banks and general governments of OECD countries nowadays towards deploying their monetary and fiscal policies, respectively. Furthermore, it is the view embodied in the Neoclassical New Keynesian transformed Dynamic Stochastic General Equilibrium (DSGE) models of the Business Cycle (see Vines and Wills, 2018).

According to the NNS, the economy is constantly in an equilibrium seeking path. However, in the short run, due to temporary shocks on demand (mainly), the output deviates from its long run trend generating an output gap and/or the business cycle. The output gap is offset in the long run. Thus, temporary shocks do not cause permanent effects on supply. In other words, it is assumed that demand policies, such as monetary and fiscal policies, are neutral in the long run.

Prices in the economy can be flexible or sluggish. Expectations may or may not be rational. The NNS believes that the monetary policy is sufficient for stabilizing the cycle and that there are benefits from controlling inflation (Goodfriend and King, 1997). Therefore, price stability and/or minimizing the deviation of

inflation from the target should be the main goal to be achieved by monetary policy. Albeit, Taylor (1993, 1999) considers minimizing the output gap also as a goal.

Neoclassical New Keynesianism is behind the NNS (Costa et al., 2020). Neoclassical New Keynesianism combines market failures and price rigidities of Neoclassical Keynesianism, the monetary focus of Neoclassical Monetarism, and the possibility of rational expectations and the microeconomic foundations of Neoclassical New Classicism (Costa et al., 2020). See, for instance, Mankiw (1985), Yellen (1984), and Greenwald and Stiglitz (1993). Moreover, modern Neoclassical New Keynesianism models of the business cycle have incorporated both the Neoclassical New Classical Real Business Cycle (RBC) DSGE models and the New Keynesian Phillips Curve (see Clarida, Galí, and Gertler, 1999; and Blanchard and Galí, 2007). These models have been used throughout the world by central banks (Blanchard, 2015; Romer, 2016), although they have been put to test during the GFC. The GFC brought a renewed interest on fiscal policy as a stabilization tool (Blanchard, 2015; Romer, 2016; and Vines and Wills, 2018).

Finally, Lucas (2003) considers that countercyclical stabilization policies have little effect since they are offset by the rational expectations of economic agents. "He argues that monetary policy emphasis should be placed on providing price stability for the agents' expectations formation, while fiscal policy emphasis should be placed on providing people with better incentives to work and save" (Lucas, 2003, cited by Costa *et al.*, 2020, page 3). The view of Lucas (2003) has been prevalent in the euro area (Costa *et al.*, 2020).

2.2 The HP filter

The Hodrick-Prescott (HP) filter is a well-known filter used in business cycle analysis by renowned Institutions such as the IMF. King and Rebelo (1993) and Cooley and Prescott (1995) have grown fond of this filter due to its advantageous simple application towards nonstationary time series data. The filter removes the trend out of raw data as a weighted moving average:

$$\min_{y_t^T} L = \sum_{t=1}^{S} (y_t - y_t^T)^2 + \lambda \sum_{t=2}^{S-1} (\Delta y_{t+1}^T - \Delta y_t^T)^2 \qquad (1)$$

y_t^T long run trend at time t

y_t time t observation of the time series

λ smoothing parameter.

The cycle is given by the deviations of the trend. The smoothing parameter λ is a penalty factor on abrupt fluctuations. Its value depends on the frequency of the data and of the economy (Costa *et al.*, 2020). A value of $\lambda = 100$ is recommended in the literature with regards to annual data (Costa *et al.*, 2020).

There are some disadvantages towards employing the HP filter and hence some alternative filters are mentioned in the literature (e.g., the Baxter-King filter and the Hamilton filter). The main disadvantages of the HP filter relate to the choice of the smoothing parameter λ, which affects the results, and the boundary problem, which translates into errors in the estimates based on data from the beginning and end of the sample period. On these drawbacks see, for instance, Baxter and King (1999), Phillips and Jin (2015), and Hamilton (2018).

2.3 Variables affecting long-term interest rates in the sort run

Knoop (2015) analyses the cyclical behavior of key macroeconomic variables:

a) Expenditures: Consumption, Investment, and Government purchases;
b) Net exports;
c) Labour market variables: Total unemployment, Duration of unemployment, Initial unemployment rates, Real wages;
d) Money supply and inflation: Money supply (M1), GDP deflator inflation, Consumer Price Index, (CPI) inflation;
e) Financial variables: Short-term interest rates, Long-term interest rates, Stock prices, Corporate profits;
f) Capacity and productivity: Capacity utilization, Productivity;
g) Expectations: Consumer Confidence Index.

These key macroeconomic variables are the fundamentals of the economy. The most important are object of the forecasts of Institutions such as the IMF, the OECD, and the EC. In addition, variables such as government purchases, net exports, and real wages have been a target of the Troika programmes. Of course, financial variables such as long-term interest rates also reflect expectations of the financial markets, which, according to the NNS, can but need not to be rational (Costa *et al.*, 2020).

Knoop (2015) looks to the correlations between the cyclical component of the several variables and the cyclical component of GDP. These are the stylized facts of the business cycle. Instead, we will be looking to the way the cyclical component of the several variables affects the cyclical component of long-term interest rates.

2.4 Expectations, financial markets, and government debt

In Romer's simple model of Sovereign-Debt crises (Romer, 2018, page 704), a government is thinking on whether to issue debt. Risk neutral investors are doubtful whether to buy the government's debt. Equilibrium is determined by two conditions in the probability of default and the interest factor: i) the condition for risk neutral investors to be willing to hold government debt (the expected pay off holding government debt must be equal to the risk free payoff); and ii) the probability of government default as a function of the risk factor. Based on the expectations of financial investors and the fundamentals faced by governments, the model generates multiple equilibria. That is, multiple equilibria are possible with the same fundamentals.

There are two main possibilities of equilibria, one that investors are expecting no bankruptcy and are willing to buy the bonds and another where they are not. When investors are not willing to buy government debt, this automatically generates a certain default for the government. Thus, the concept of self-fulfillment is introduced. In addition, in the light of a bankruptcy the investor did not expect this outcome, otherwise would not have invested.

The model transmits that high debt leads to a higher required rate of return and therefore lower future government revenues increase the probability of default. Considering multiple periods, the model argues that investor's expectations are concerned and influenced by other investors' beliefs. These expectations influence the government's ability to issue debt and pay the required installments at the prevailing interest factor during the maturity of the bonds.

There have been many articles in the specialized press, including from the Economist, describing the separation of the financial markets from the real economy since the 2008 GFC. To serve as an example, the United States Stock exchange gas grown more than proportionally compared to its real economy. Nowadays, it is postulated by leading economists that there will be a bubble burst in the Technology sector, since they have outgrown every other sector and outperformed the real economy as never seen before.

In the regression model, we will deal with the issue of expectations of financial markets on government debt by considering the rating of government debt by rating agencies.

Chapter 3
Empirical Analysis

3.1 The Probit model regression

The purpose of the Probit model regression is to assess the factors affecting the short run behavior of long term-interest rates in the euro area 12. This assessment would help governments choosing the right time to issue sovereign debt and therefore reducing the service of the debt.

The Probit model equation is given by:

$$Pr(\mathrm{Y} = 1|\mathrm{X}) = \Phi(X^T\beta) \qquad (2)$$

With $Y = 1$, if there is a short run increase in long-term interest rates, and $Y = 0$, otherwise; Pr denoting probability; and Φ denoting the Cumulative Distribution Function (CDF) of the standard normal distribution.

The β parameters are typically estimated by maximum likelihood. They are not the marginal effects since the referred probability is non-linear in the regressors. The marginal effects are calculated separately.

Considering the key macroeconomic variables identified by Knoop (2015), the variables available in the EC AMECO database, and the importance of financial markets short run behavior, the cyclical component of the following variables have been considered as regressors:

a) Gross Domestic Product (GDP) at constant prices of 2015;
b) Expenditures: Private consumption, Fixed investment, and Government purchases at constant prices of 2015;

c) Net exports at constant prices of 2015;
d) Labor market variables: Total unemployment, Real wages at constant prices of 2015, and Real unit labor costs;
e) Interest rate and inflation: Nominal short-term interest rate (which is set by the ECB interventions), (CPI) inflation;
f) Finance variables: General government gross debt, Exchange rate inflation, and Rating inflation (of agencies' rating of sovereign debt);
g) Dummy variables, by country and year, to capture the effects of other factors influencing the short run behavior of long-term interest rates.

The Probit model regression was run in STATA.

3.2 Data and its treatment

The data are mostly from the EC AMECO macroeconomic annual database. The exceptions are two finance variables: the euro dollar exchange rate and Moody's country (sovereign debt) ratings. These were downloaded, respectively, from the OECD database and Moody's website.

The data includes 144 observations on 12 Member States of the euro area 12 in 12 years (period 2007–2018). Such data is regarded in econometrics as a balanced panel data. The years 2007 and 2008 correspond to the beginning of the GFC, being 2007 the first year showing an economic slowdown.

Variables expressed in volumes (GDP, private consumption, fixed investment, government purchases, net exports, and total unemployment) and real wages were log transformed. The other variables, expressed as percentages or indexes, were not log transformed.

Except for GDP, the HP filter with a smooth parameter of $\lambda = 100$ (as recommended in the literature with regard to annual data) was used to separate the cyclical component of the several variables. In the case of GDP, the AMECO database provides the cyclical component of this variable.

Except for variables expressed as percentages, cyclical components are expressed as the deviation from the trend over the trend times 100. For variables expressed as percentages, the cyclical components are taken as the deviations.

Finally, in what concerns the Probit dependent variable, positive deviations of the cyclical component of the long-term interest rate imply $Y = 1$, otherwise, $Y = 0$.

All the above variable transformations were done in Excel. Table 1. shows the average and the standard deviation of the transformed variables considered in the Probit regression. All the numbers were rounded to the 3 decimals.

Table 1: Summary statistics of the transformed variables. Source: Author.

Variable	Mean	Standard deviation
Long-term nominal interest rate (Probit binary variable)	0.389	0.489
GDP (ln)	-0.244	0.700
Expenditures Private final consumption (ln) Fixed investment (ln) Government purchases (ln)	 0.000 -0.010 0.000	 0.450 2.548 0.493
Net exports	-0.233	16.390
Labor market variables Total unemployment (ln) Real wages (ln) Real unit labor costs	 -0.019 0.000 -0.009	 2.543 0.2933 2.254
Interest rate and Inflation Nominal short-term interest rate Consumer Price Index (CPI) inflation	 -0.299 0.000	 1.313 2.662
Finance variables General government gross debt Exchange rate inflation Rating inflation	 0.000 0.000 0.033	 0.804 6.964 30.078

3.3 Results and discussion

Table 2 shows the Probit model marginal effects at the mean results and significance. The dummy variables' marginal effects were omitted.

Table 2: Probit model marginal effects at the mean and significance. Source: Author. Values marked with ***, **, and * are significant at 1%, 5%, and 10% level of significance, respectively.

INDEPENDENT VARIABLES	**dy/dx**
GDP (ln)	0.066
Expenditures	
Private final consumption (ln)	-0.034
Fixed investments (ln)	-0.219***
Government purchases (ln)	0.586**
Net exports	
Net exports of goods and services (ln)	-0.007
Labor market variables	
Total unemployment (ln)	0.005
Real wages (ln)	0.337
Real unit labor costs	0.064**
Nominal short-term interest rate	0.039
Inflation and financial variables	
Consumer price index inflation	0.150***
General government gross debt	-2.296
Exchange rate inflation	-0.021**
Rating inflation	0.006***

The marginal effects at the mean are the most used in the Probit model literature. Anyway, the reader can find the complete STATA output, including the Probit regression descriptive statistics, the estimated beta coefficients, the marginal effects at the mean, and the average marginal effects, in the Appendix.

Results refer to the short run behaviour of the transformed variables considered. They show that, in the short run, an increase in long-term interest rates is more likely:

a) 0.586 % by every additional unit of government purchases (ln).
b) 0.064 % by every additional unit of real unit labor costs.
c) 0.150 % by every additional unit of Consumer Price Index (CPI) inflation.
d) 0.006 % by every additional unit of rating inflation.

And it is less likely:

a) 0.219 % by every additional unit of fixed investment (ln).
b) 0.021 % by every additional unit of exchange rate inflation.

The signs of the significant coefficients are as expected. Three variables seem to affect the most the sort run behavior of long-term interest rates: Government purchases, Fixed investment, and Consumer Price Index (CPI) inflation. Knoop (2015) describes a countercyclical behaviour of Government purchases in rich countries and a procyclical behavior of Investment and Consumer Price Index (CPI) inflation. Altogether, the results point for lower nominal long-term interest rates if the governments of the euro area 12 choose to issue debt in periods of expansion of the economy. By doing so, they will reduce the costs with the debt service.

Another interesting result is the non-significance of the nominal short-term interest rate set by the ECB. This may be explained by the liquidity trap situation lived in the euro area 12, in the period under analysis.

Chapter 4
Conclusions

The aim of the dissertation was to assess the factors that affect the short run behavior of long-term interest rates in the euro area 12 and to advise the respective governments on the timing of issuing sovereign debt, avoiding the occurrence of unnecessary costs with the service of debt. A Probit model approach was used in the assessment.

Results show that three variables affect the most the short run behavior of long-term interest rates: Government purchases, Fixed investment, and Consumer Price Index (CPI) inflation. Given Knoop (2015) stylized facts of business cycle on these three variables, altogether the obtained results show that, in the short run, governments of the euro area 12 face lower nominal long-term interest rates if they issue debt in periods of economic expansion. In doing so, they will reduce the overall costs with debt service.

The study has some limitations, namely the set of explanatory variables that could be considered in the regression. In addition, filters alternative to the HP filter, such as the Hamilton filter, could be used to test the robustness of the results obtained.

Moreover, to foster further investigation on the dissertation topic, some alternatives are in order. The first alternative would be to disaggregate the countries being analysed in two or more groups. An example could be PIIGS and FRUGALS, both groups mentioned and criticized since the 2008 GFC. Another alternative would be to redo the analysis with a bigger timespan, addressing the subperiod after the euro and before the GFC, and the subperiod corresponding to the aftermath of the corona virus pandemic.

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Appendix

1- Cyclical behaviors of key macroeconomic variables

Table 1A Cyclical behaviors of key macroeconomic variables

Variables	**Direction**
Expenditures	
Consumption	Procyclical
Investment	Procyclical
Government purchases	Countercyclical
Net exports	Countercyclical
Nominal short-term interest rates	Procyclical
Labor market variables	
Total unemployment	Countercyclical
Real Wages	Inconsistent
Inflation and financial variables	
Consumer price index inflation	Procyclical

Source: Adapted from Knoop (2015)

2- Probit model STATA output

Table 2A Probit model statistics and beta coefficients

Probit regression — Number of obs = 144
LR chi2(17) = 84.51
Prob > chi2 = 0.0000
Log likelihood = -53.97468 — Pseudo R2 = 0.4391

longterminterestrates	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
grossdomesticproduct2015ln	.195073	.2672173	0.73	0.465	-.3286632	.7188092
privatefinalconsumption2015ln	-.1006343	.8918031	-0.11	0.910	-1.848536	1.647268
fixedinvestments2015ln	-.6429834	.228521	-2.81	0.005	-1.090876	-.1950904
governmentpurchases2015ln	1.719946	.7636281	2.25	0.024	.2232625	3.21663
netexports2015ln	-.0193514	.0211805	-0.91	0.361	-.0608643	.0221615
totalunemployment ln	.0145085	.1082869	0.13	0.893	-.19773	.2267469
realwages ln	.9907173	.7666906	1.29	0.196	-.5119687	2.493403
realunitlaborcosts	.1885034	.093805	2.01	0.044	.0046489	.3723579
nominalshortterminterestrates	.113189	.1382106	0.82	0.413	-.1576988	.3840768
consumerindexpriceinflation	.4390592	.1214459	3.62	0.000	.2010296	.6770888
generalgovernmentgrossdebt	-6.745486	4.182296	-1.61	0.107	-14.94264	1.451665
exchangerateinflation	-.0615547	.0303692	-2.03	0.043	-.1210773	-.002032
ratinginflation	.0185998	.0065494	2.84	0.005	.0057632	.0314364
d2007	-.5325659	1.008344	-0.53	0.597	-2.508884	1.443752
d2008	-.1486267	.6199911	-0.24	0.811	-1.363787	1.066534
d2009	-.8035729	.6843933	-1.17	0.240	-2.144959	.5378133
d2010	-2.361116	.8464202	-2.79	0.005	-4.020069	-.7021628
_cons	-.1702855	.197141	-0.86	0.388	-.5566747	.2161038

Table 3A Probit model marginal effects at the mean

```
Conditional marginal effects                    Number of obs     =        144
Model VCE    : OIM

Expression   : Pr(longterminterestrates), predict()
dy/dx w.r.t. : grossdomesticproduct2015ln privatefinalconsumption2015ln fixedinvestments2015ln governmentpurchases2015ln
               netexports2015ln totalunemploymentln realwagesln realunitlaborcosts nominalshortterminterestrates
               consumerindexpriceinflation generalgovernmentgrossdebt exchangerateinflation ratinginflation d2007 d2008 d2009 d2010
at           : grossdomes~n    =   -.2436441 (mean)
               privatefin~n    =   -.0004666 (mean)
               fixedinves~n    =    -.010458 (mean)
               government~n    =   -.0004378 (mean)
               netexports~n    =   -.2326745 (mean)
               totalunemp~n    =   -.0185508 (mean)
               realwagesln     =   -.0001414 (mean)
               realunitla~s    =    -.009497 (mean)
               nominalsho~s    =   -.2992033 (mean)
               consumerin~n    =    5.61e-15 (mean)
               generalgov~t    =    4.80e-15 (mean)
               exchangera~n    =    2.50e-10 (mean)
               ratinginfl~n    =    .0326729 (mean)
               d2007           =    .0833333 (mean)
               d2008           =    .0833333 (mean)
               d2009           =    .0833333 (mean)
               d2010           =    .0833333 (mean)
```

	Delta-method dy/dx	Std. Err.	z	P>|z|	[95% Conf.	Interval]
grossdomesticproduct2015ln	.0664078	.0914987	0.73	0.468	-.1129263	.245742
privatefinalconsumption2015ln	-.0342585	.3041965	-0.11	0.910	-.6304727	.5619558
fixedinvestments2015ln	-.2188879	.0759778	-2.88	0.004	-.3678017	-.0699742
governmentpurchases2015ln	.5855135	.2682981	2.18	0.029	.0596589	1.111368
netexports2015ln	-.0065877	.0071841	-0.92	0.359	-.0206682	.0074928
totalunemploymentln	.0049391	.0368605	0.13	0.893	-.0673063	.0771844
realwagesln	.3372654	.2613987	1.29	0.197	-.1750666	.8495975
realunitlaborcosts	.0641714	.031431	2.04	0.041	.0025677	.1257751
nominalshortterminterestrates	.0385324	.0468334	0.82	0.411	-.0532593	.1303242
consumerindexpriceinflation	.1494669	.0403581	3.70	0.000	.0703665	.2285674
generalgovernmentgrossdebt	-2.296335	1.412401	-1.63	0.104	-5.064591	.4719201
exchangerateinflation	-.0209548	.0101054	-2.07	0.038	-.0407611	-.0011485
ratinginflation	.0063318	.0022269	2.84	0.004	.0019671	.0106966
d2007	-.181299	.3399645	-0.53	0.594	-.8476172	.4850191
d2008	-.0505963	.2106545	-0.24	0.810	-.4634716	.362279
d2009	-.2735567	.2354291	-1.16	0.245	-.7349892	.1878758
d2010	-.803784	.2841131	-2.83	0.005	-1.360635	-.2469326

Table 4A Probit model average marginal effects

```
. margins, dydx(*)

Average marginal effects                        Number of obs     =        144
Model VCE    : OIM

Expression   : Pr(longterminterestrates), predict()
dy/dx w.r.t. : grossdomesticproduct2015ln privatefinalconsumption2015ln fixedinvestments2015ln governmentpurchases2015ln
               netexports2015ln totalunemploymentln realwagesln realunitlaborcosts nominalshortterminterestrates
               consumerindexpriceinflation generalgovernmentgrossdebt exchangerateinflation ratinginflation d2007 d2008 d2009 d2010
```

	Delta-method dy/dx	Std. Err.	z	P>|z|	[95% Conf.	Interval]
grossdomesticproduct2015ln	.0407277	.0556293	0.73	0.464	-.0683037	.149759
privatefinalconsumption2015ln	-.0210106	.1862243	-0.11	0.910	-.3860035	.3439824
fixedinvestments2015ln	-.1342431	.0424577	-3.16	0.002	-.2174587	-.0510275
governmentpurchases2015ln	.3590931	.1497775	2.40	0.017	.0655345	.6526517
netexports2015ln	-.0040402	.0043626	-0.93	0.354	-.0125907	.0045103
totalunemploymentln	.0030291	.0226043	0.13	0.893	-.0412744	.0473326
realwagesln	.2068436	.1565363	1.32	0.186	-.099962	.5136491
realunitlaborcosts	.039356	.0188253	2.09	0.037	.0024592	.0762529
nominalshortterminterestrates	.0236318	.0286172	0.83	0.409	-.0324569	.0797205
consumerindexpriceinflation	.0916675	.0212776	4.31	0.000	.0499642	.1333708
generalgovernmentgrossdebt	-1.408333	.8442495	-1.67	0.095	-3.063032	.2463653
exchangerateinflation	-.0128515	.006128	-2.10	0.036	-.0248622	-.0008408
ratinginflation	.0038833	.0012267	3.17	0.002	.0014791	.0062875
d2007	-.11119	.2098774	-0.53	0.596	-.522542	.3001621
d2008	-.0310305	.1294412	-0.24	0.811	-.2847307	.2226696
d2009	-.1677712	.14033	-1.20	0.232	-.4428129	.1072704
d2010	-.4929575	.1611225	-3.06	0.002	-.8087519	-.1771632